

Notice of Allowability	Application No.	Applicant(s)	
	10/775,426	RAO, RAGHAVENDRA J.	
	Examiner	Art Unit	
	Thanh D. Vo	2189	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the Amendment filed on 6/02/2006 and the phone interview on July 6, 2006.
2. ☒ The allowed claim(s) is/are 1-7 and 10-19.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

DETAILED ACTION

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

2. Authorization for this examiner's amendment was given in a telephone interview with Stephen Curran (Reg. 50,664) on July 6, 2006.

The application has been amended as follows:

1. (Currently Amended) A storage system comprising:

a cache configured to store a plurality of data blocks in a first plurality of locations, wherein said cache is a non-volatile storage;

a first metadata storage including a plurality of entries configured to store metadata including block addresses of data blocks within said cache, wherein said first metadata storage is a non-volatile storage; and

a second metadata storage including a second plurality of locations configured to store metadata including said block addresses identifying said data blocks within said cache and further including pointers to said data blocks within said cache, wherein said second metadata storage is a volatile storage;

said metadata stored within said second metadata storage is arranged into one or more cache descriptors each associated with a respective data block; and

wherein said one or more cache descriptors are arranged into one or more groups, wherein a given group includes one or more cache descriptors that correspond to contiguous logical block addresses of an underlying storage volume.

8. – 9. (Cancelled)

14. (Currently Amended) A method comprising:

storing a plurality of data blocks in a first plurality of locations of a cache, wherein said cache is a non-volatile storage;

storing within a non-volatile first metadata storage including a plurality of entries, metadata including block addresses of data blocks within said cache; and

storing within a volatile second metadata storage including a second plurality of locations, metadata including said block addresses identifying said data blocks within said cache and further including pointers to said data blocks within said cache;

arranging said metadata stored within said second metadata storage into one or more cache descriptors each associated with a respective data block; and

arranging said one or more cache descriptors are into one or more groups, wherein a given group includes one or more cache descriptors that correspond to contiguous logical block addresses of an underlying storage volume.

20. – 21. (Cancelled)

Reason for Allowance

3. The following is an examiner's statement of reasons for allowance:

With respect to independent claims 1 and 14:

Royer, JR. et al. (US Pub 2003/005219) discloses:

a cache to store plurality of data blocks, wherein the cache is a non-volatile storage (page 2, paragraph 0019, lines 5-7);

a first metadata storage including a plurality of entries configured to store metadata including block addresses of data blocks within said cache, wherein said first metadata storage is non-volatile storage (page 2, paragraph 0019, lines 8-14);

a second metadata storage including a second plurality of locations each configured to store metadata including a block address identifying a corresponding data block within said cache (page 2, paragraph 0025), wherein the metadata can be stored in a volatile storage and the metadata are defined to identify the data blocks stored in the cache. Since the metadata is used to identify the data blocks within the cache, therefore a first pointer pointed to corresponding data block within said cache memory is inherent.

Koseki et al. (US Patent 6,732,124) further discloses:

A metadata pointer contains in a metadata descriptor points to a metadata object/data (See Fig. 12, and col. 16, lines 10-12).

However, neither Royer, JR et al. Koseki et al., nor prior art records teach wherein the metadata stored within the second metadata storage is arranged into one or more cache descriptors each associated with a respective data block; and wherein

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said one or more cache descriptors are arranged into one or more groups, wherein a given group includes one or more cache descriptors that correspond to contiguous logical block addresses of an underlying storage volume.

Claim 14 is reciting the limitations that are similar to the allowable subject matter recited in claim 1. Therefore, claim 18 is also patentable over the prior art records.

Claims 2-7, 10-13, and 15-19 are also allowable since they depend from their respective allowable independent claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh D. Vo whose telephone number is (571) 272-0708. The examiner can normally be reached on M-F 9AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reginald G. Bragdon can be reached on (571) 272-4204. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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7/19/2006


7/21/06

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